"GIS Viewer Solutions for an Indiana Harbor Redevelopment Project"

Laura Benneyworth, AMEC
Jeff Heisler, The Community Builders
Kevin Heeney, AMEC
David Greene, AMEC
Jeff Albee, AMEC

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"GIS Viewer Solutions for an Indiana Harbor Redevelopment Project"

- Redevelopment Project in Lake Co. performed by The Community Builders/Lakefront Revitalization
- Project Objective--remove obstacles to lake shore access, and link the local community to Lake Michigan
- AMEC --Develop a GIS database, base map, and viewer to assist in project planning and visualization of data for use by the non-GIS proficient team members
- Evaluated viewers based on a variety of criteria
- Viewing options: ArcReader, *ArcExplorer, AccuGlobe, ArcMap+Google Earth, and a custom website*

MARKTOWN
HISTORIC DISTRICT
EAST CHICAGO, INDIANA

CITY OF EAST CHICAGO
PROGREDEMUR
18 INDIANA

The Community Builders, Inc.

CITY OF GARY

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GIS Benefits to the Project

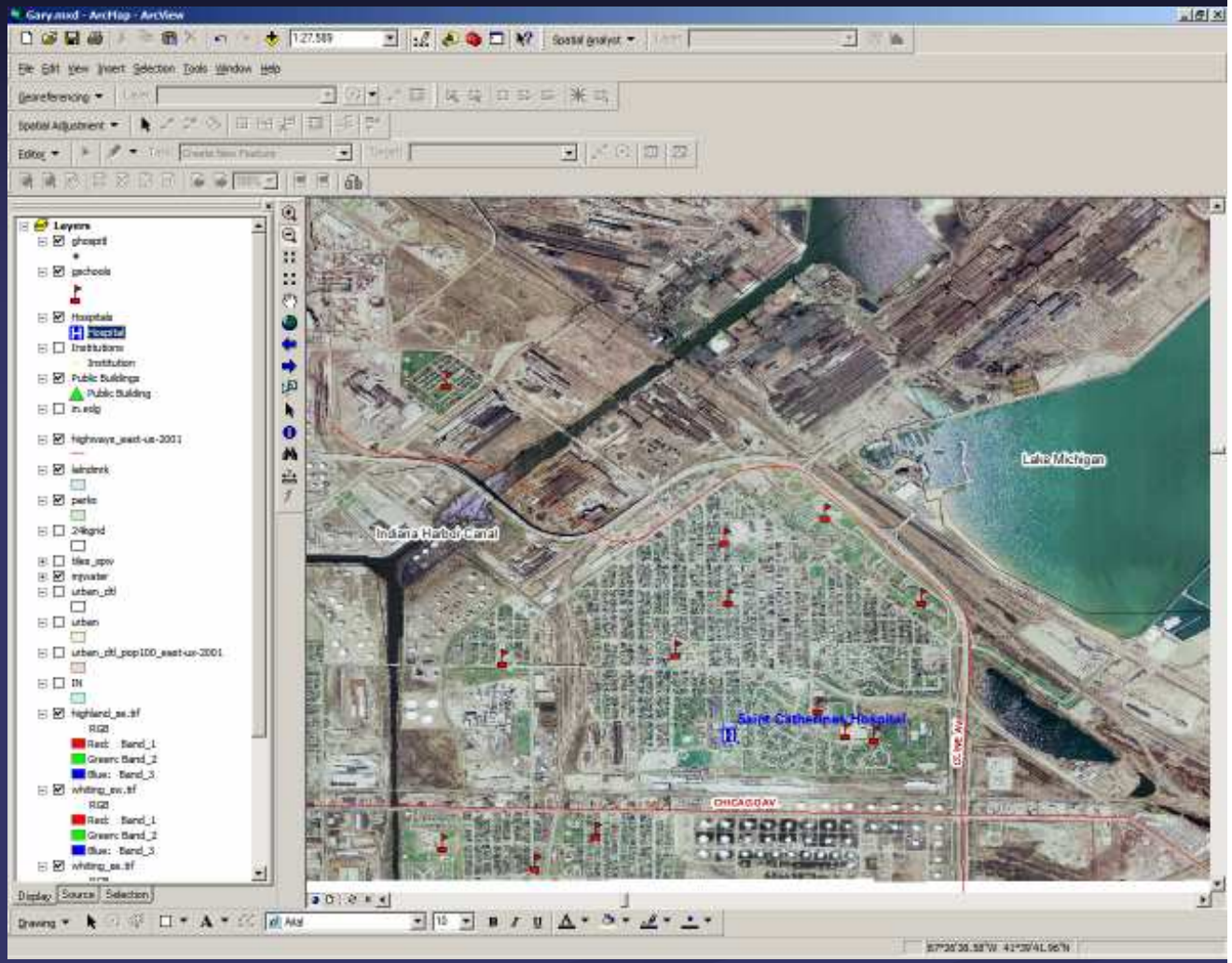
- Geography Brings Together Widely Disparate Disciplines
- Helps Us See the "Big Picture"
- Cost Savings--Operational Efficiencies
- Better Data Management--More Efficient Storage and Updating
- Facilitates Better Decisions
- Faster Information Access
- Promotes Data Sharing
- Enhances Communication

Sources of Existing Data:

- The City of East Chicago
- Indiana Spatial Portal
- Gary Sanitary District
- Northwest Indiana GIS Forum
- Lake County Surveyor
- USEPA Region 5
- Indiana Geological Survey, Lake Rim GIS
- IDEM
- ESRI

Base Map-Created in ArcView 9.2

- Environmental
- Infrastructure
  - -Parcels
  - -Structures
  - -Utilities
  - -Transportation
  - -Parks & Recreation
- Boundary
- Topo & Landscape
- Project-Specific
- Demographics
- Orthos



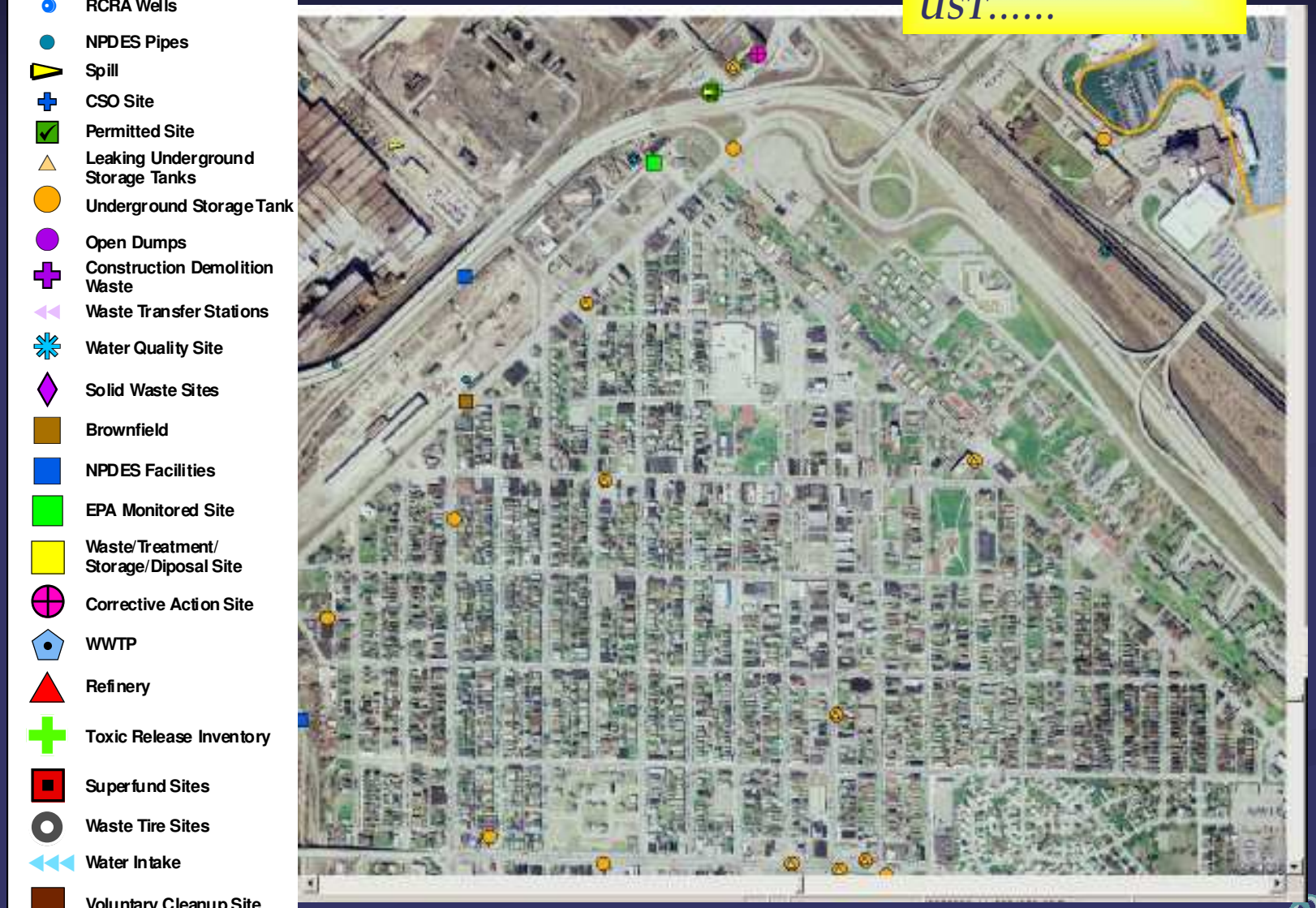
All layers projected to IN State Plane West, NAD83; in ERSI File geodatabase format

ArcView Base Map (points)

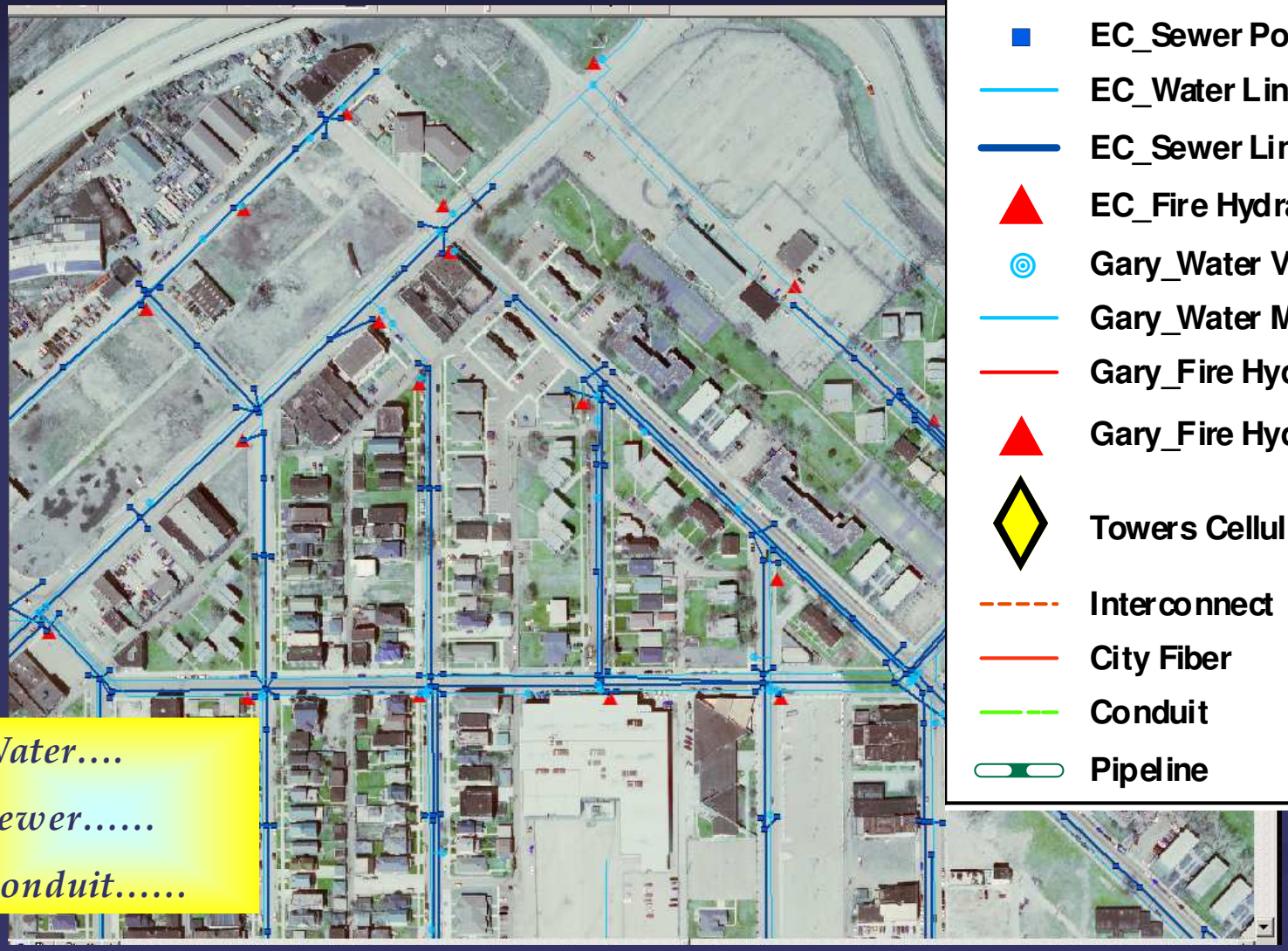
NPDES….

RCRA……

UST……



ArcView Base Map (lines)



INFRSTRUCTURE/UTILITIES

- EC_Water Valve
- EC_Sewer Point
- EC_Water Line
- EC_Sewer Line
- EC_Fire Hydrant
- Gary_Water Valves
- Gary_Water Main
- Gary_Fire Hydrant Lead
- Gary_Fire Hydrant
- Towers Cellular
- Interconnect
- City Fiber
- Conduit
- Pipeline

Water....

Sewer.....

Conduit.....

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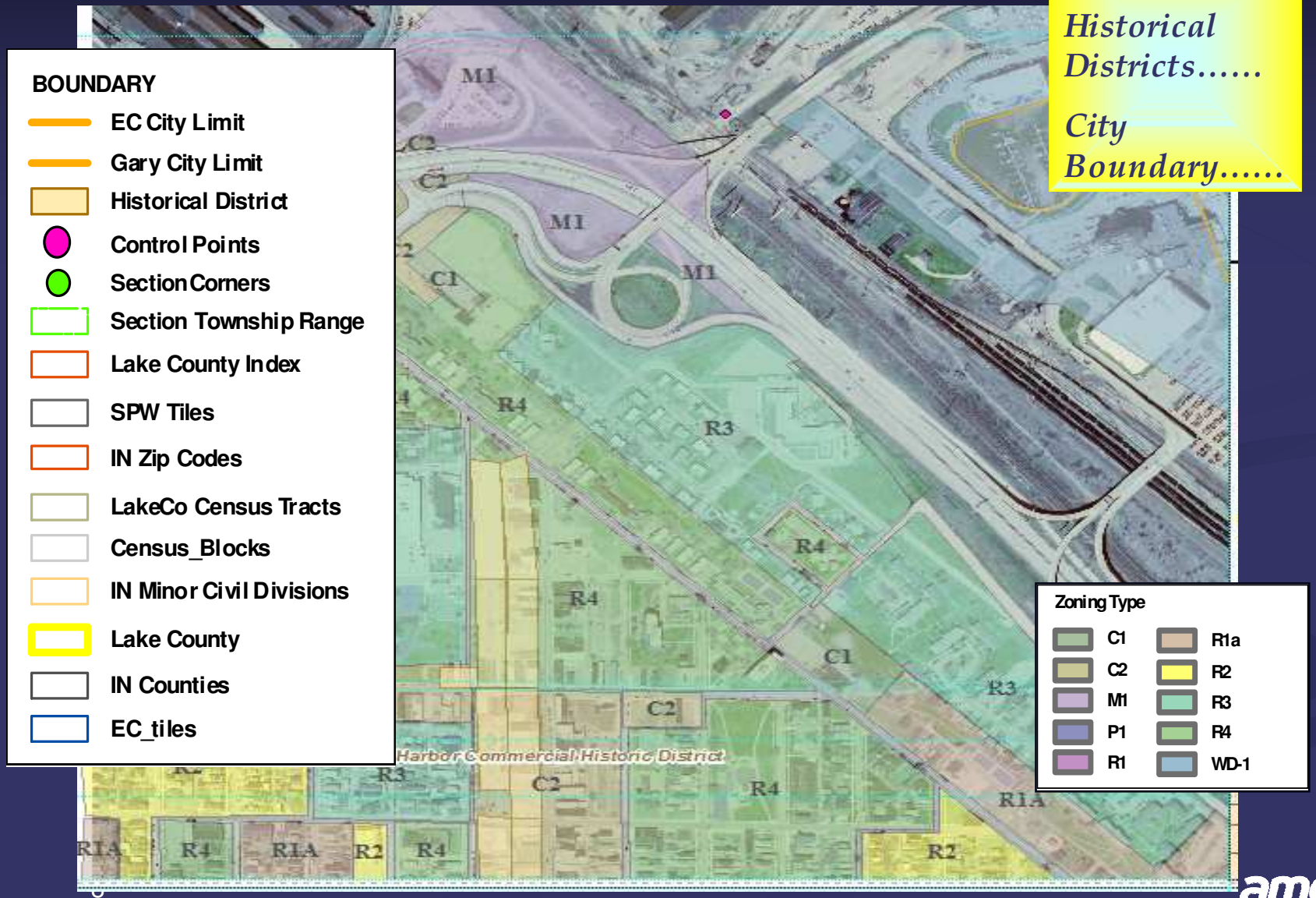
ArcView Base Map (polygons)

Zoning....

Historical Districts.....

City Boundary.....



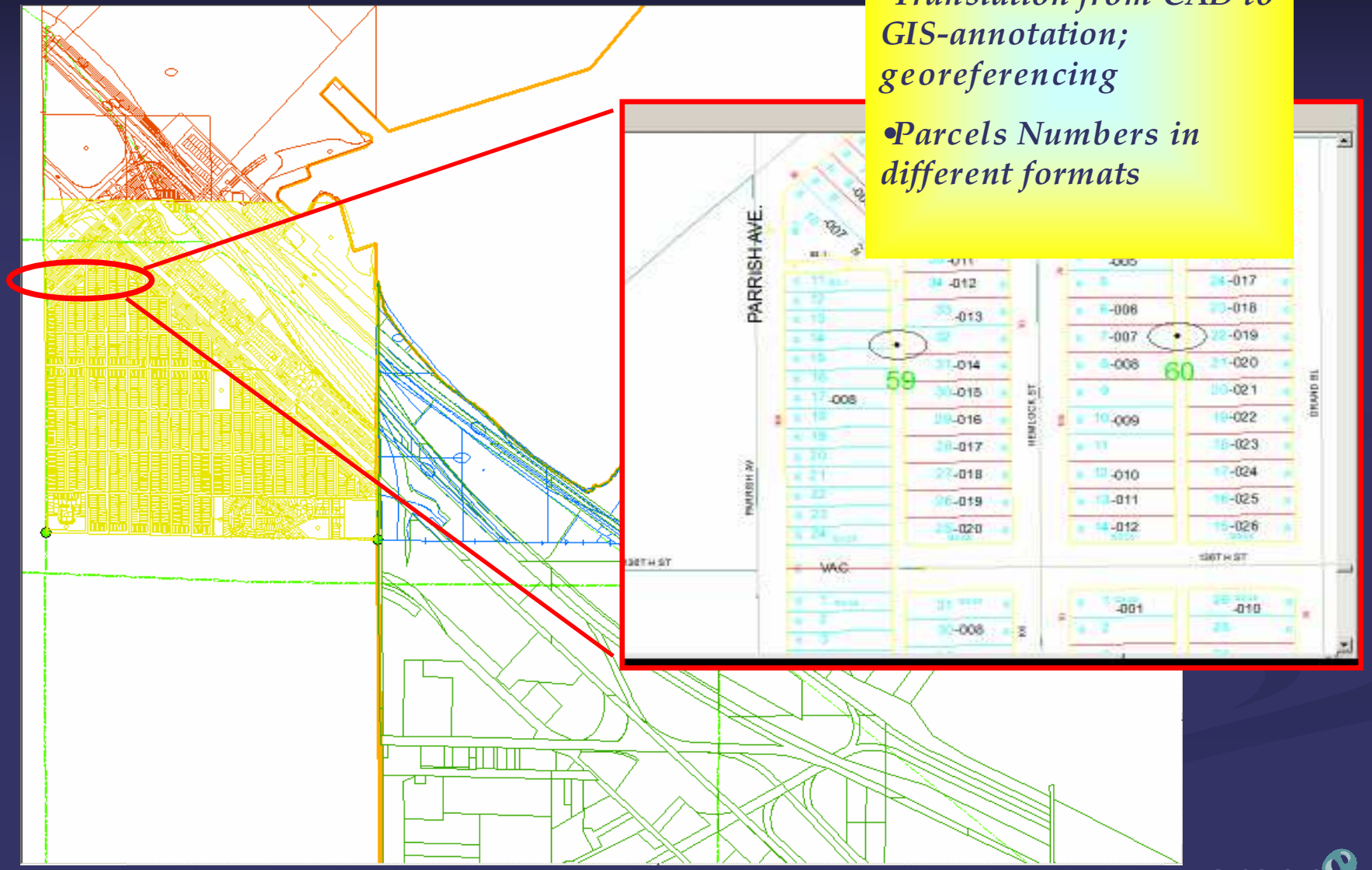
Metadata for Data Layers

- Type
- Source
- Data Year
- Metadata Source
- Min. Scale in Map
- Max. Scale in Map
- New Name
- Original Name
- Contents/Quality
- Shape Type Rank
- Recommend Use
- Primary Display Field

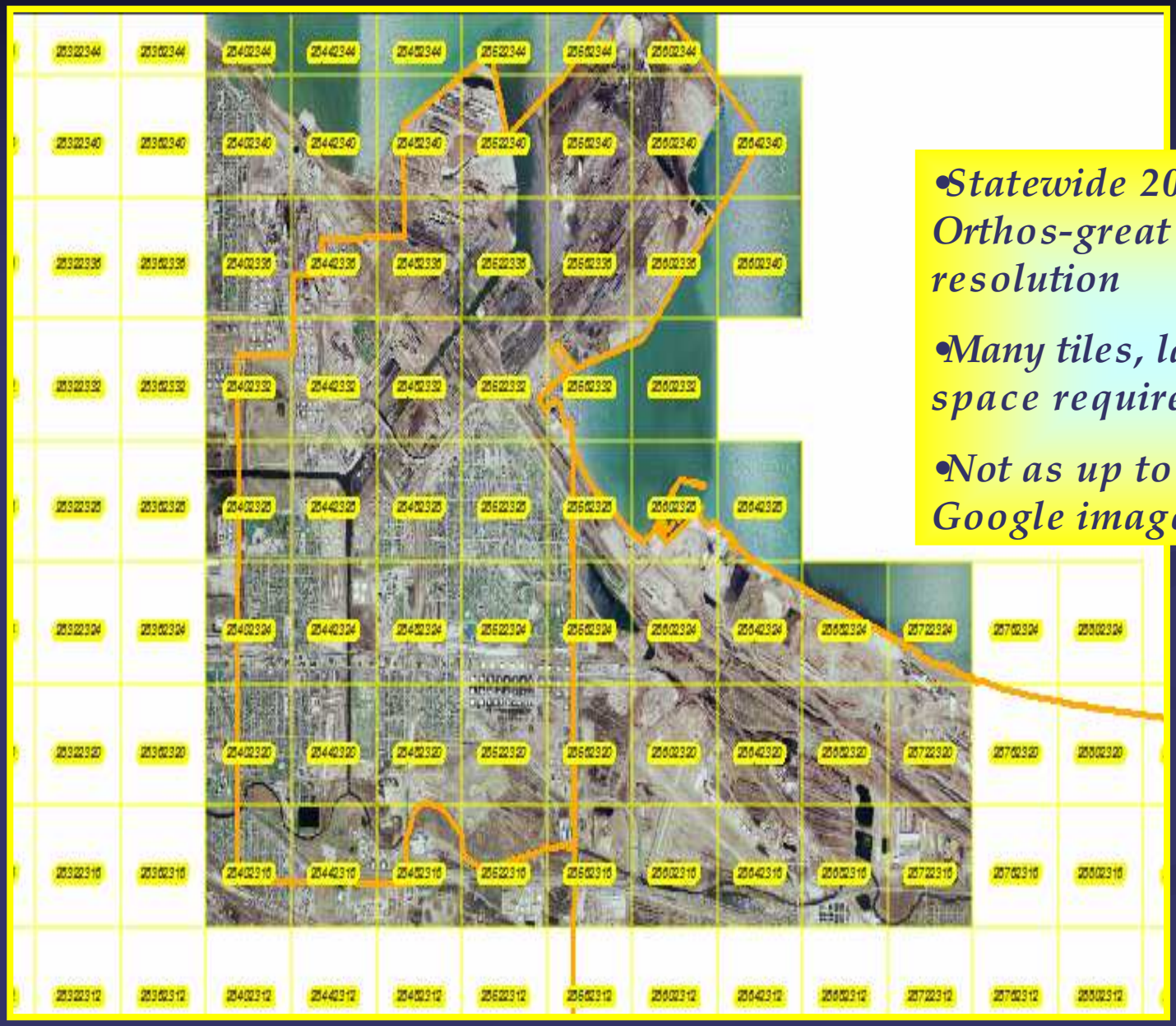
Definition	Source	Type	Data Yr	Metadata	Min. Scale (Out Beyond)			
Section,Township,Range	IGS GIS Atlas for IN 083107 (via IDEM)	Boundary	?	M	70,000			
States	ESRI data, Nashville Server 2007	Boundary	2001	A	5,000,000			
Zoning	Kevin Miller of IDEM 091807	Boundary	?	M	144000			
Census Blocks	ESRI data, Nashville Server 2007	Demographics	2000; 2002	A	70,000			
Census-Ancestry/Ethnicity	IGS GIS Atlas for IN 083107 (via IDEM)	Demographics	1890-2000	M*	5,000,000	70000	IN_Census_MCD_Ancestry	_Ethnicity_IN
Census_Population Changes	IGS GIS Atlas for IN 083107 (via IDEM)	Demographics	1890-2000	M*	5,000,000	70000	IN_Census_MCD_PopChange	Census_MCD_PopChange_IN
Census-Children_Poverty	IGS GIS Atlas for IN 083107 (via IDEM)	Demographics	2000; updated 2006	M*	5,000,000	70000	IN_Children_Poverty	Children_Poverty_UB_IN
Counties	ESRI data, Nashville Server 2007	Demographics	1992-2002	A	5,000,000	1,000,000	IN_cty	IN_cty
Census-Minor Civil Divisions	IGS GIS Atlas for IN 083107 (via IDEM)	Demographics	2000	M*	5,000,000	70000	IN_Minor_Civil_Divisions	Minor_Civil_DivisionN

Parcels (in CAD) Present a Challenge…

- *Parcels Not Available*
- *Translation from CAD to GIS-annotation; georeferencing*
- *Parcels Numbers in different formats*



Aerial Photography



- *Statewide 2005 Orthos-great resolution*
- *Many tiles, large space requirements*
- *Not as up to date as Google imagery*

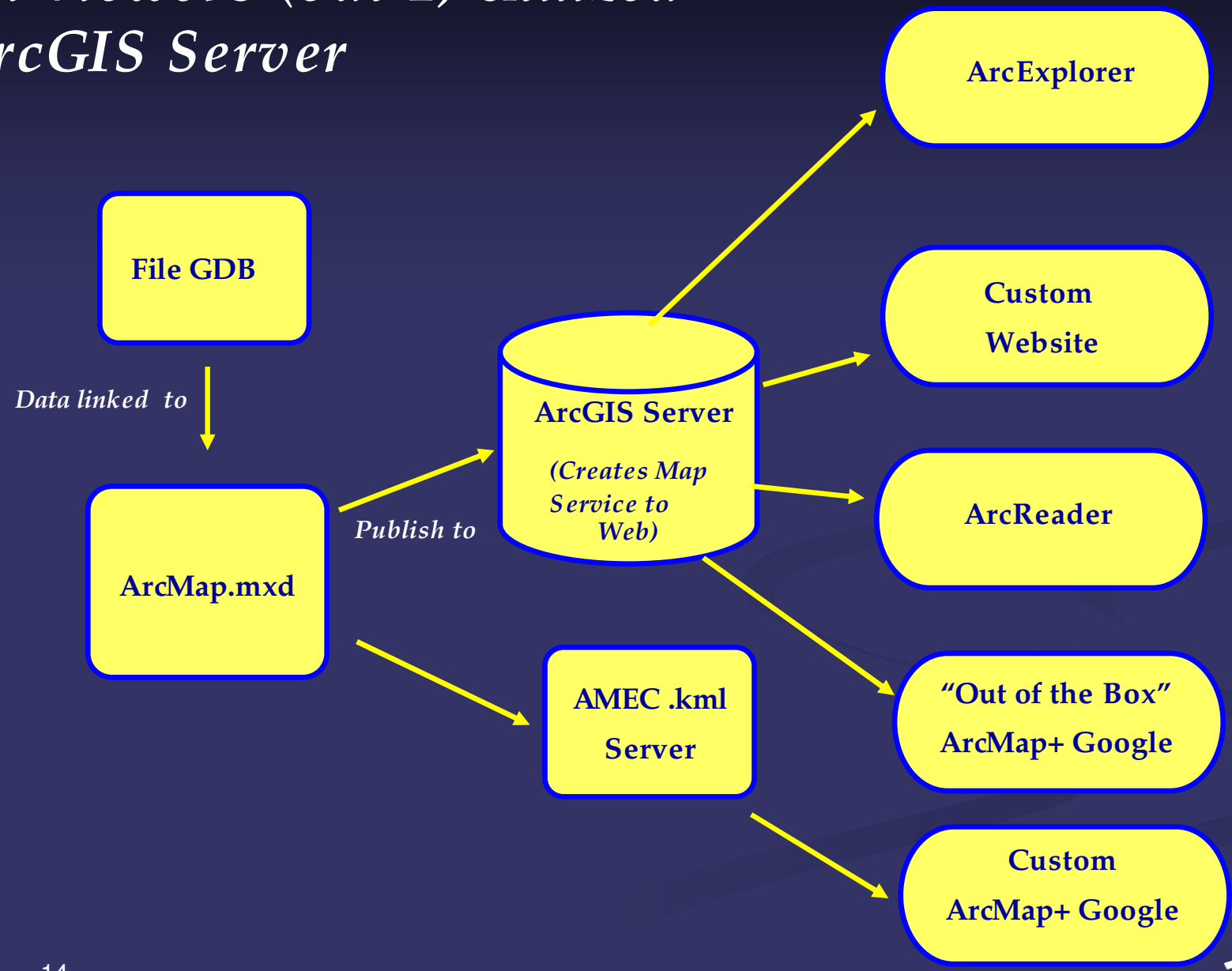
Viewer Critical Parameters:

- Cost
- Easy to Use
- Available to wide audience
- Ability to see attributes
- Data centralization
- Ability to add Google "Sketch Up" (3 D) files
- Ability to add CAD files
- High resolution aerials
- Speed of loading, refresh, zoom
- Expandability
- Printing
- Controlled access

Data Viewers Evaluated :

1. ESRI ArcExplorer
2. ESRI ArcReader
3. Custom ArcMap+Google Earth
4. Custom Website
5. AccuGlobe

All Viewers (but 1) Utilized ArcGIS Server



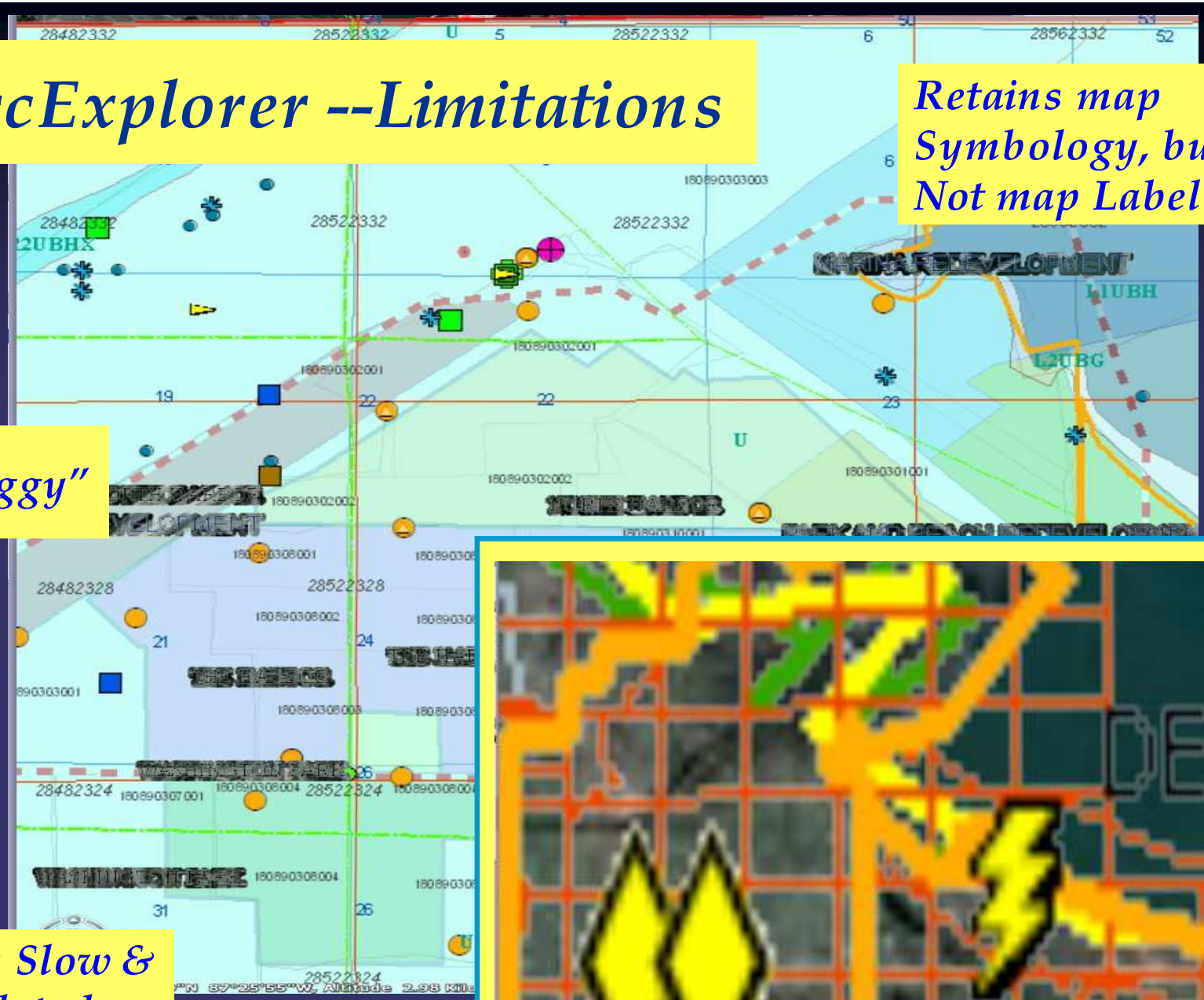
1. ArcExplorer

ArcExplorer --Limitations

Retains map Symbology, but Not map Labels

"Buggy"

Very Slow & Pixelated



ArcExplorer

Features

- Free
- Compatible with ArcMap
- Can add 3D
- Same layer structure as ArcMap
- Many functions

Limitations

- Very slow
- Uses File gdb, not Personal gdb
- Quirky in ArcGIS Server

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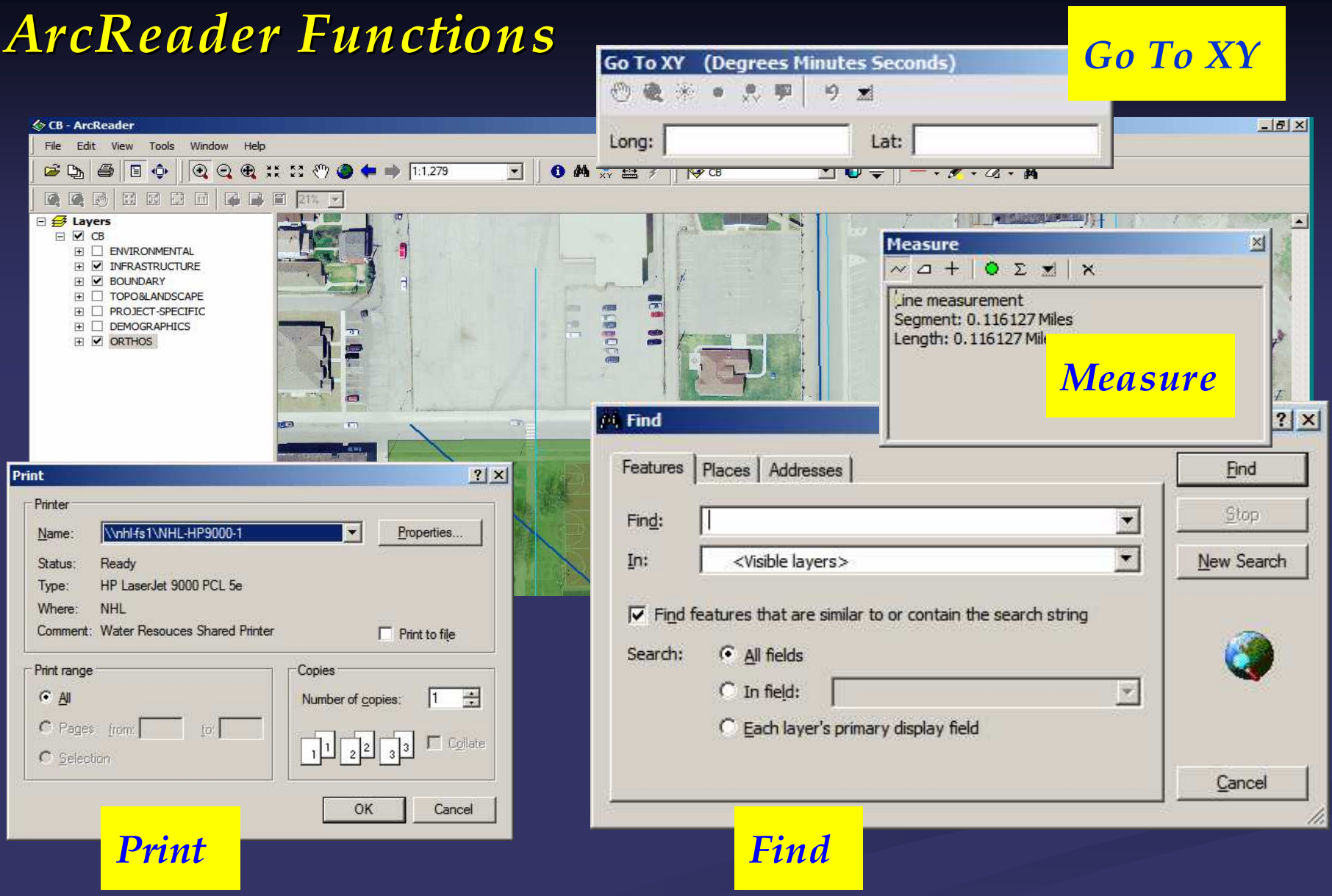
2. ArcReader

ArcReader--Features

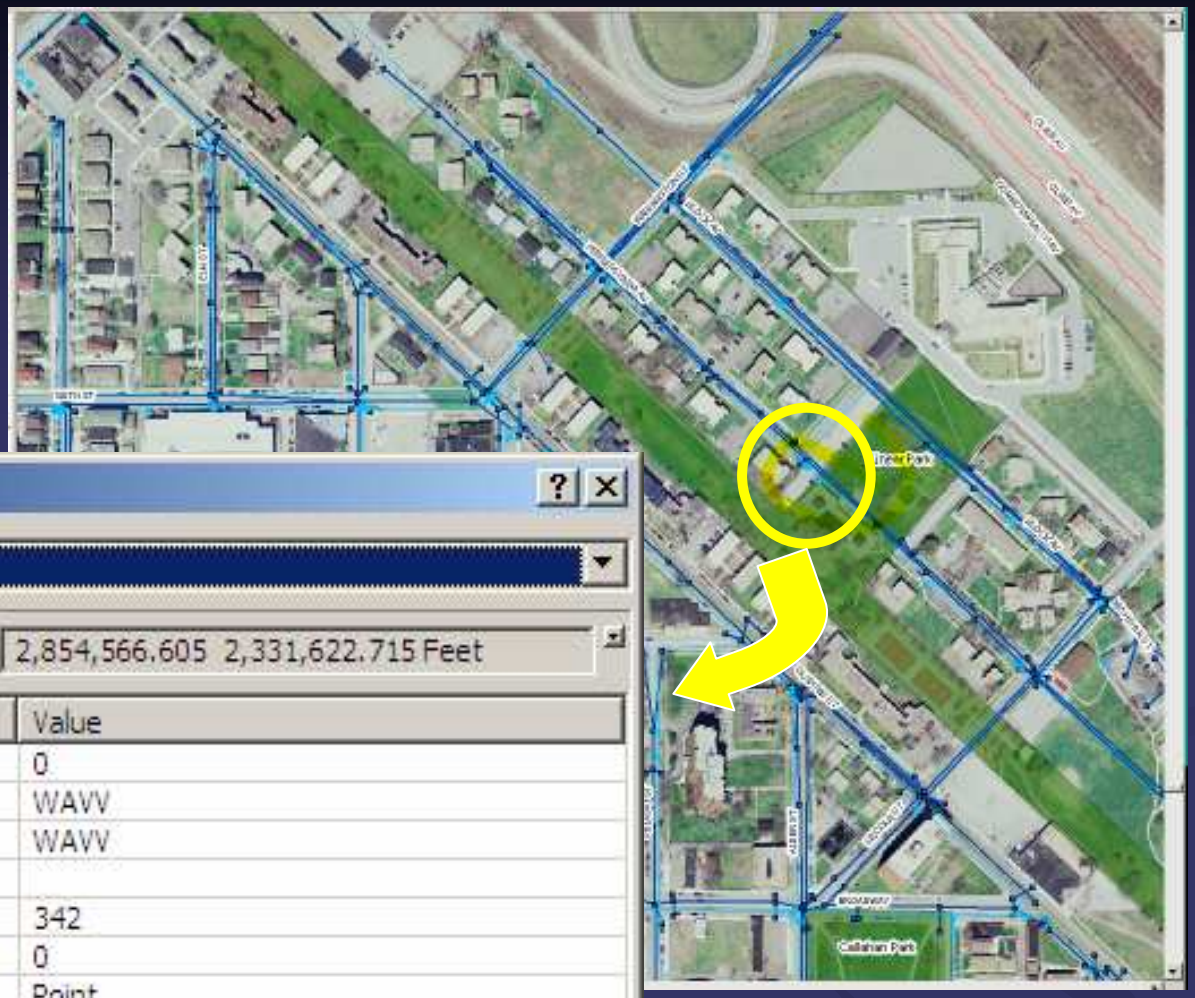
- Free to users
- Can create with central data source (link to server)
- Can control access/protect data (ArcGIS Server)
- Can view, explore, and print ArcGIS maps
- Can zoom, pan, identify, find, measure, magnify, hyperlink
- Looks like and is organized the same as ArcGIS base map
- Has same labels and symbols as ArcGIS base map
- Can see scales of layers
- Can see all attributes, and ID features in the map
- Can change units in map
- Can print to scale
- Can see multiple features simultaneously
- Can make direct highlights

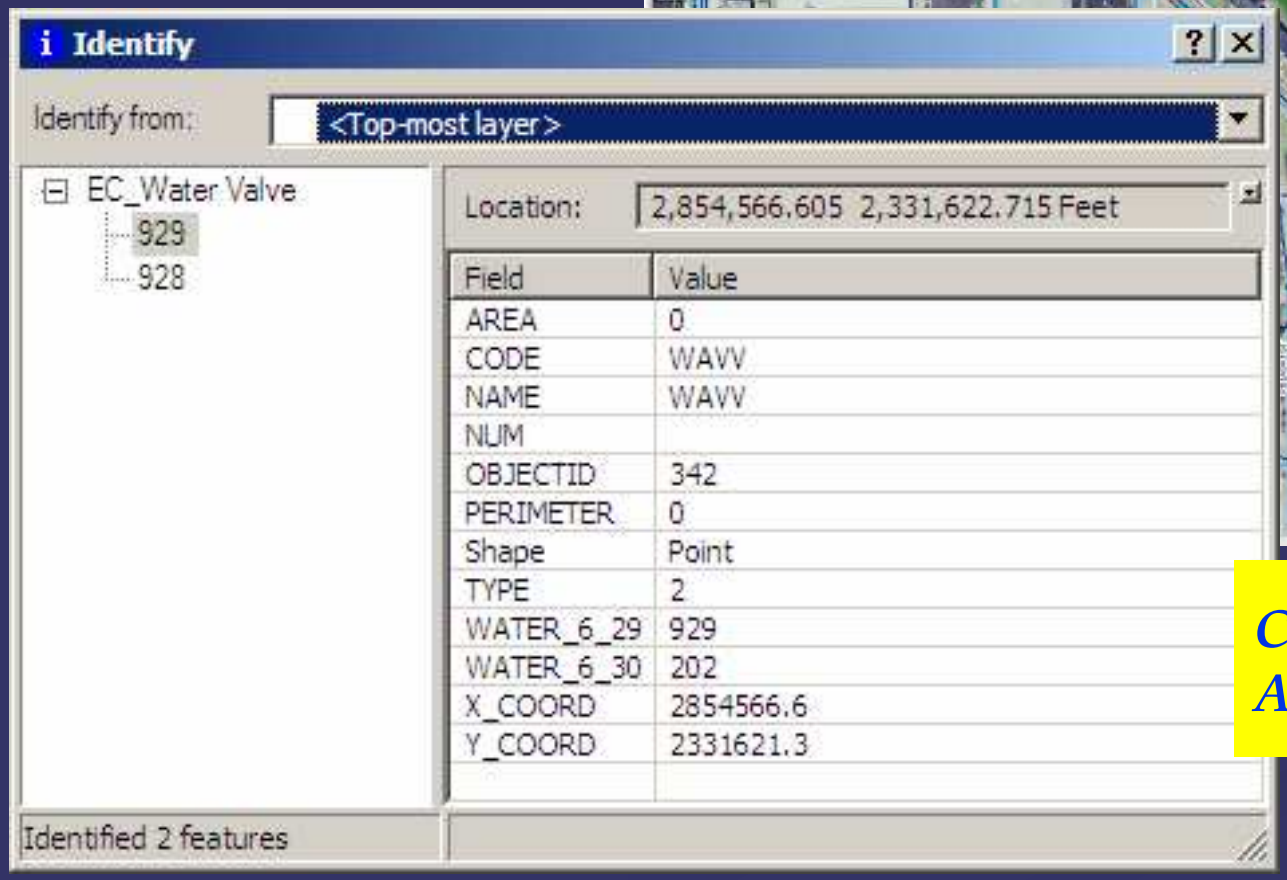
ArcReader Functions



ArcReader Functions

Identify





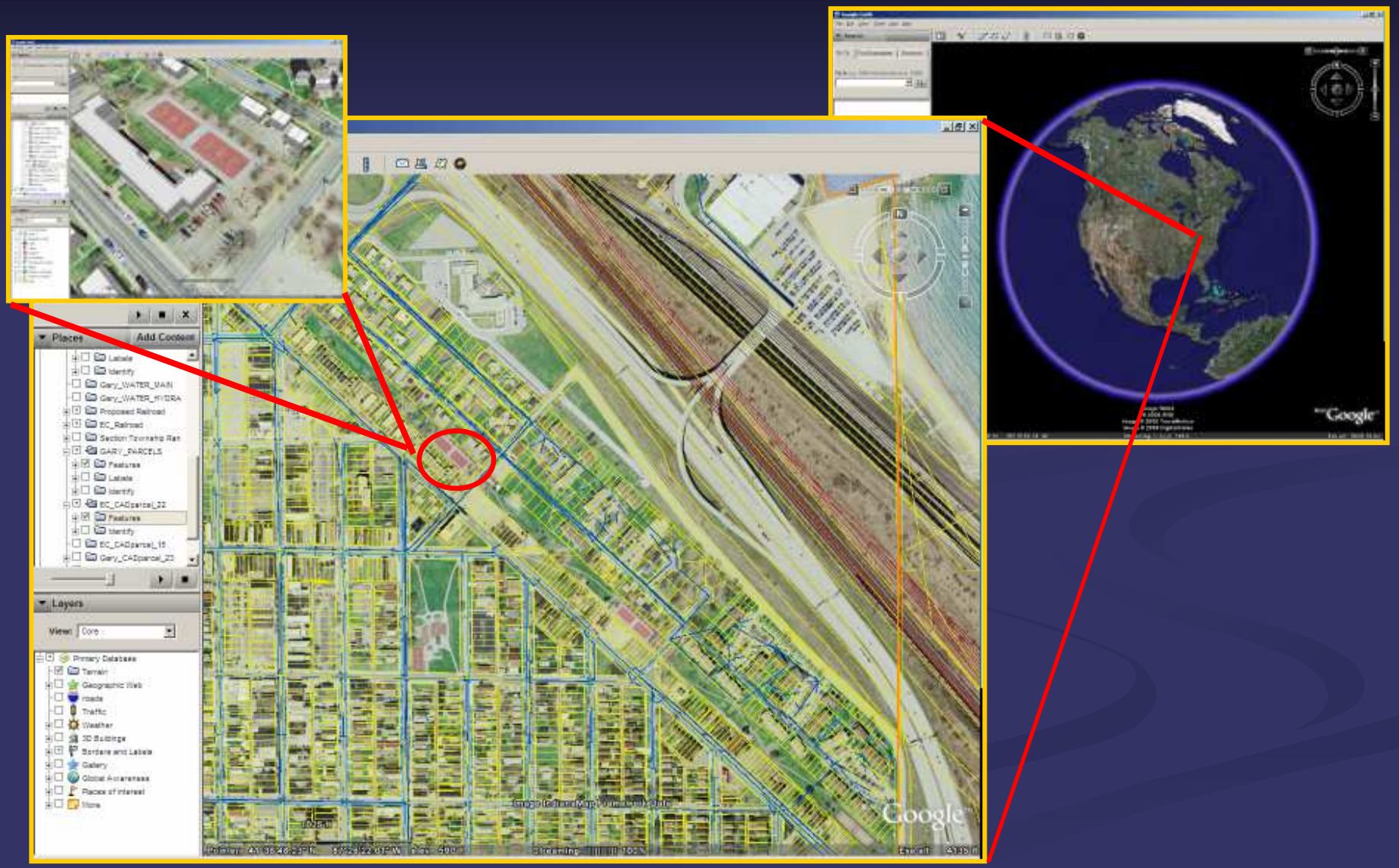
Can See & Search Attributes

ArcReader--Limitations

- User cannot edit data
- ArcPublisher $2,000
- Not entirely dynamic--have to publish new .pmfs when changes made to layout
- Lower resolution imagery than Google Earth
- Slow to add initially; can be slow to refresh
- Speed depends on configuration of local machine and type of connection

3. ESRI ArcMap + Google Earth

ArcMap + Google Earth

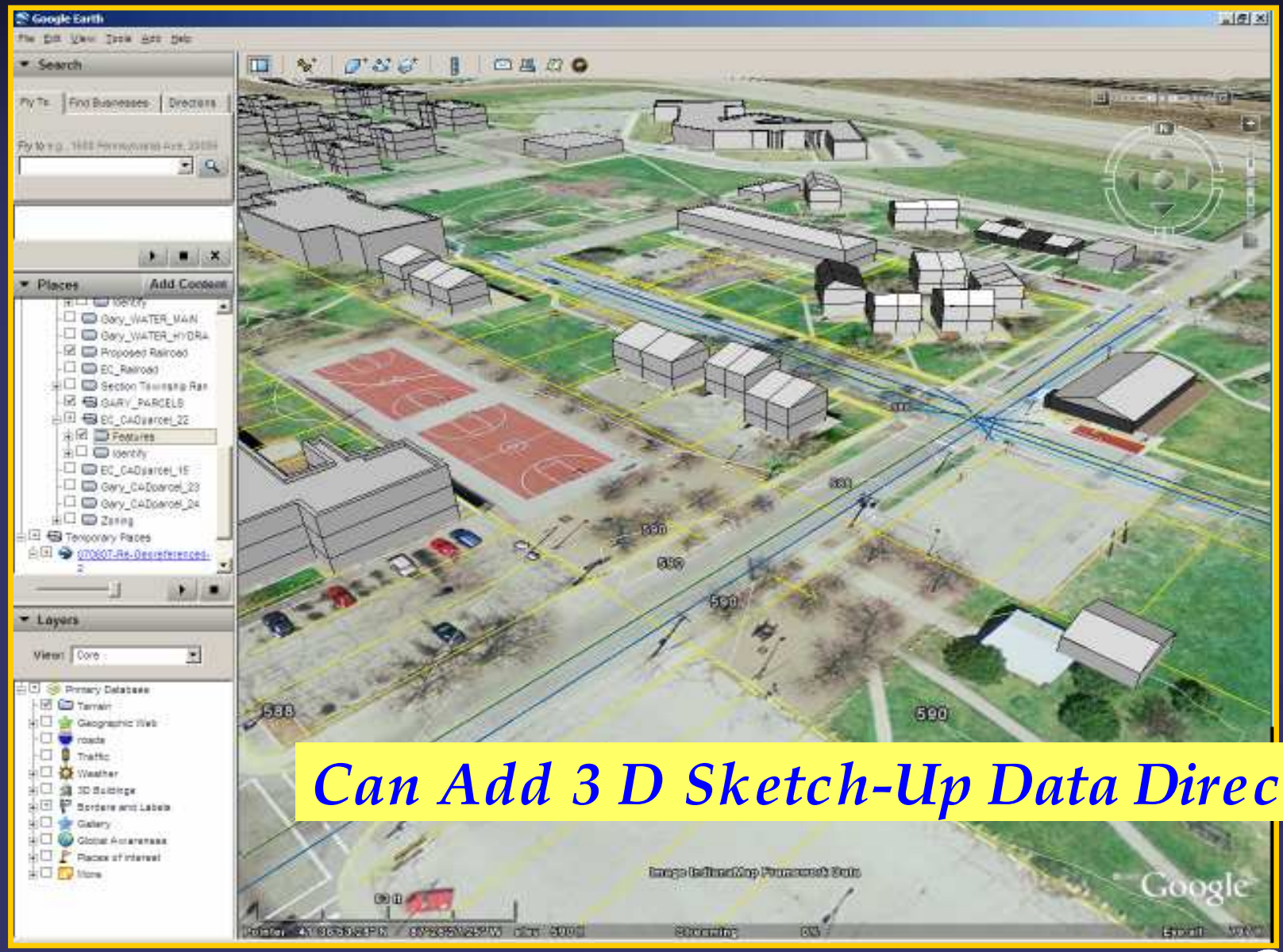


*ArcMap+Google Earth--Features**

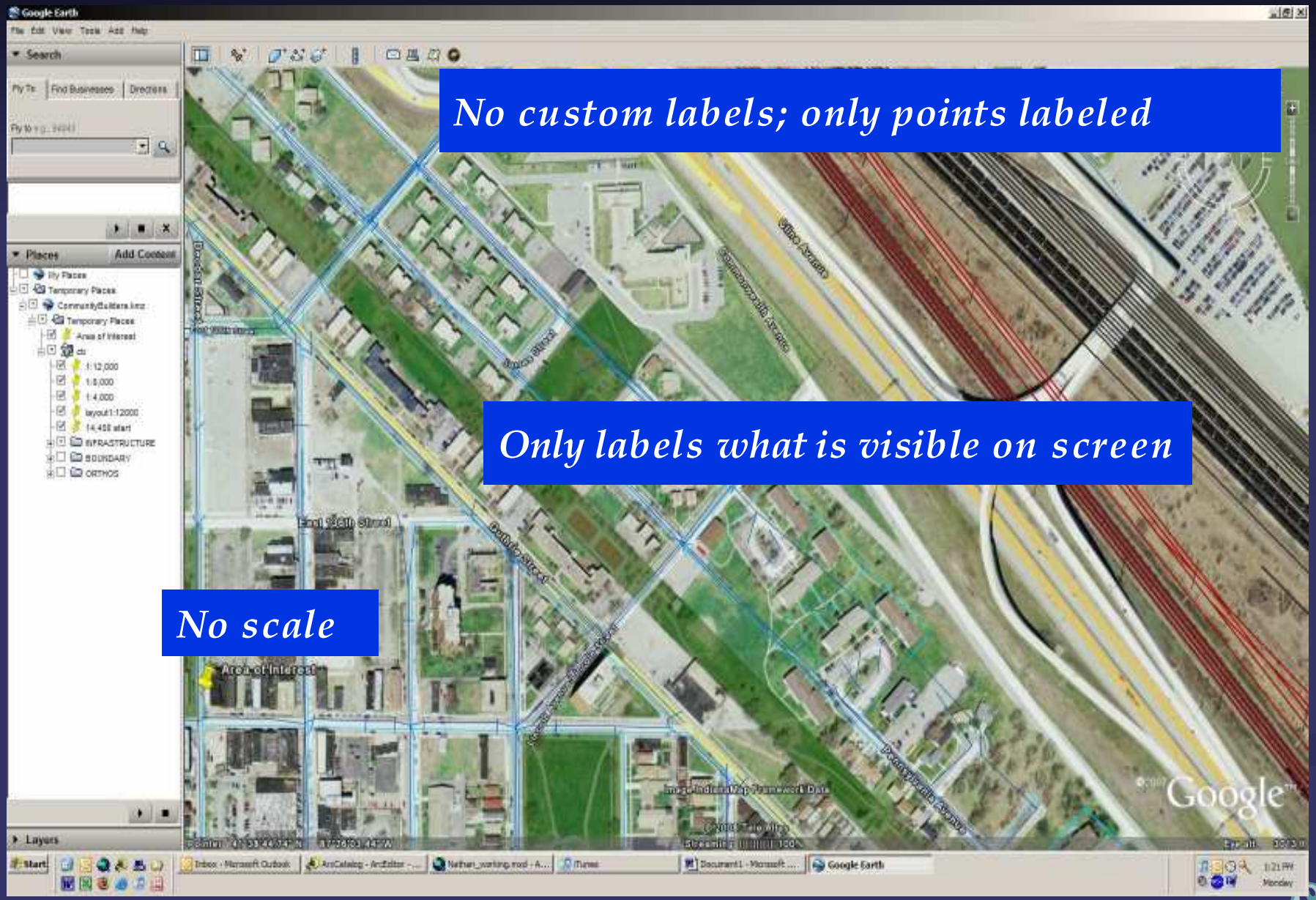
- Can directly add 3D Sketch-Up files
- Centralized data source
- High quality, up-to-date imagery
- Anyone can access through Internet
- Uses lat/long
- SP4 –can see attributes based on Object ID
- Can add CAD via source .mxd (and maybe directly?)

* *non-developer version*

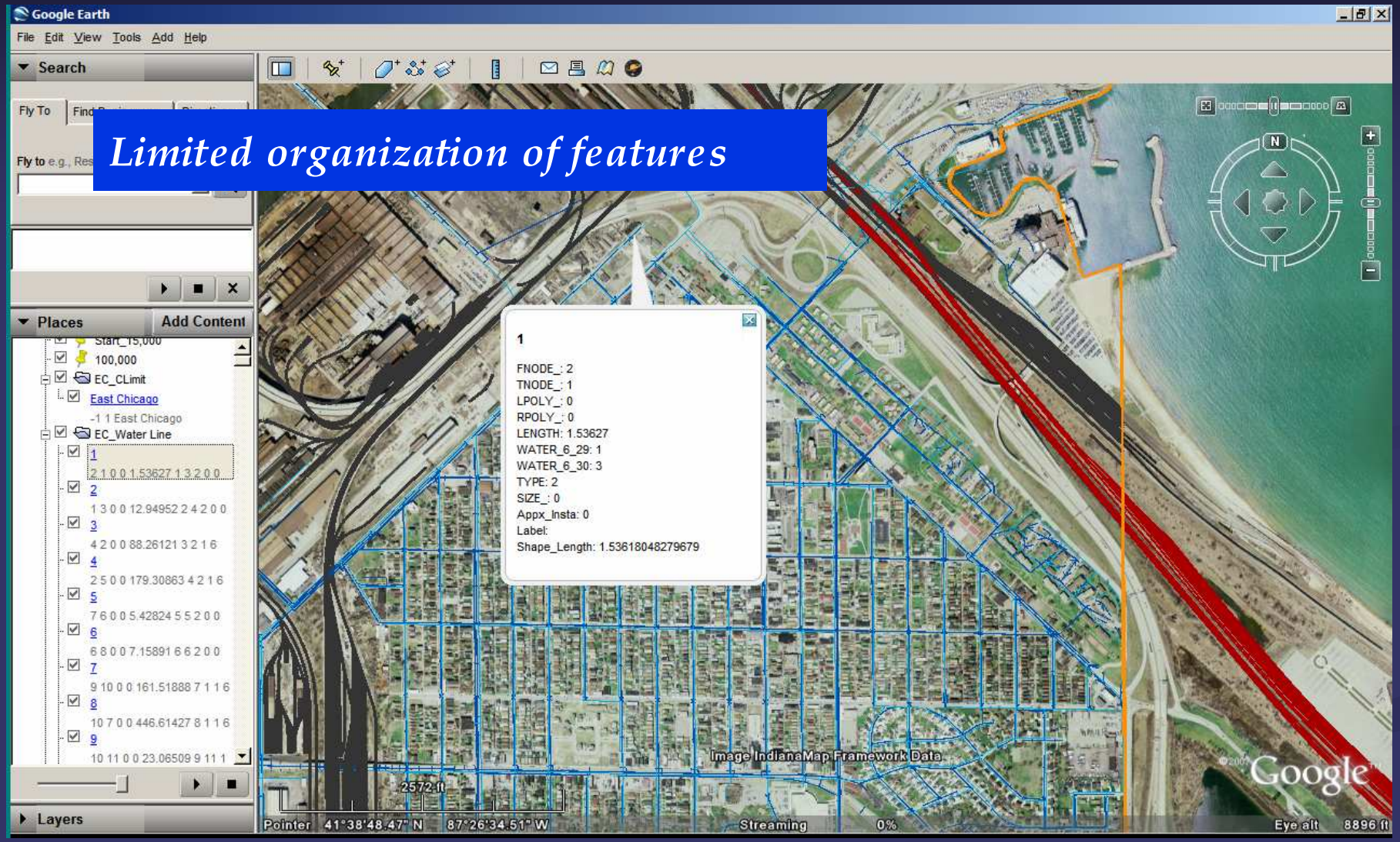
ArcMap+Google Earth Functions



ESRI ArcMap+Google Earth ("Out of the Box") --Limitations



ArcMap + Google Earth--Limitations



ArcMap+Google Earth--Customized

- AMEC programmed in C#, .NET
- Projects on the fly
- Added attribute viewing
- Advanced label functions
- Created 3 folders-show features only or with labels
- Can view all labels (not just what is visible)
- "Out of range message"

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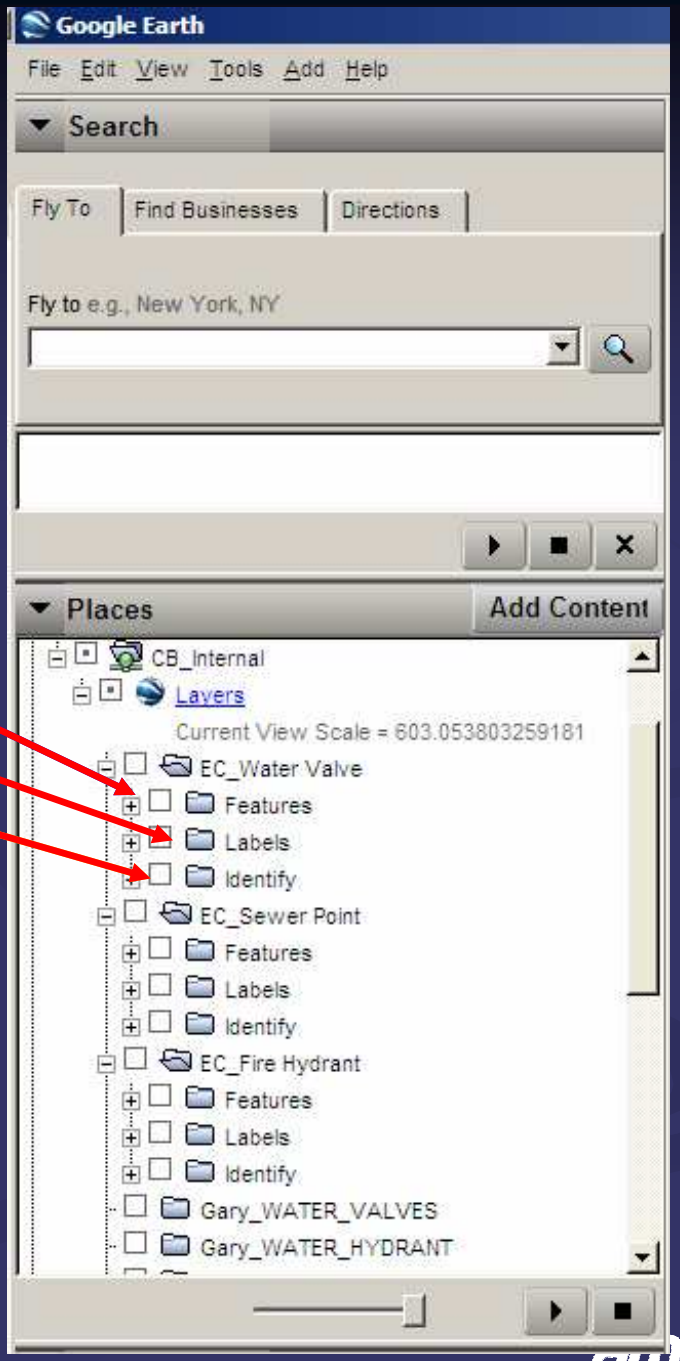
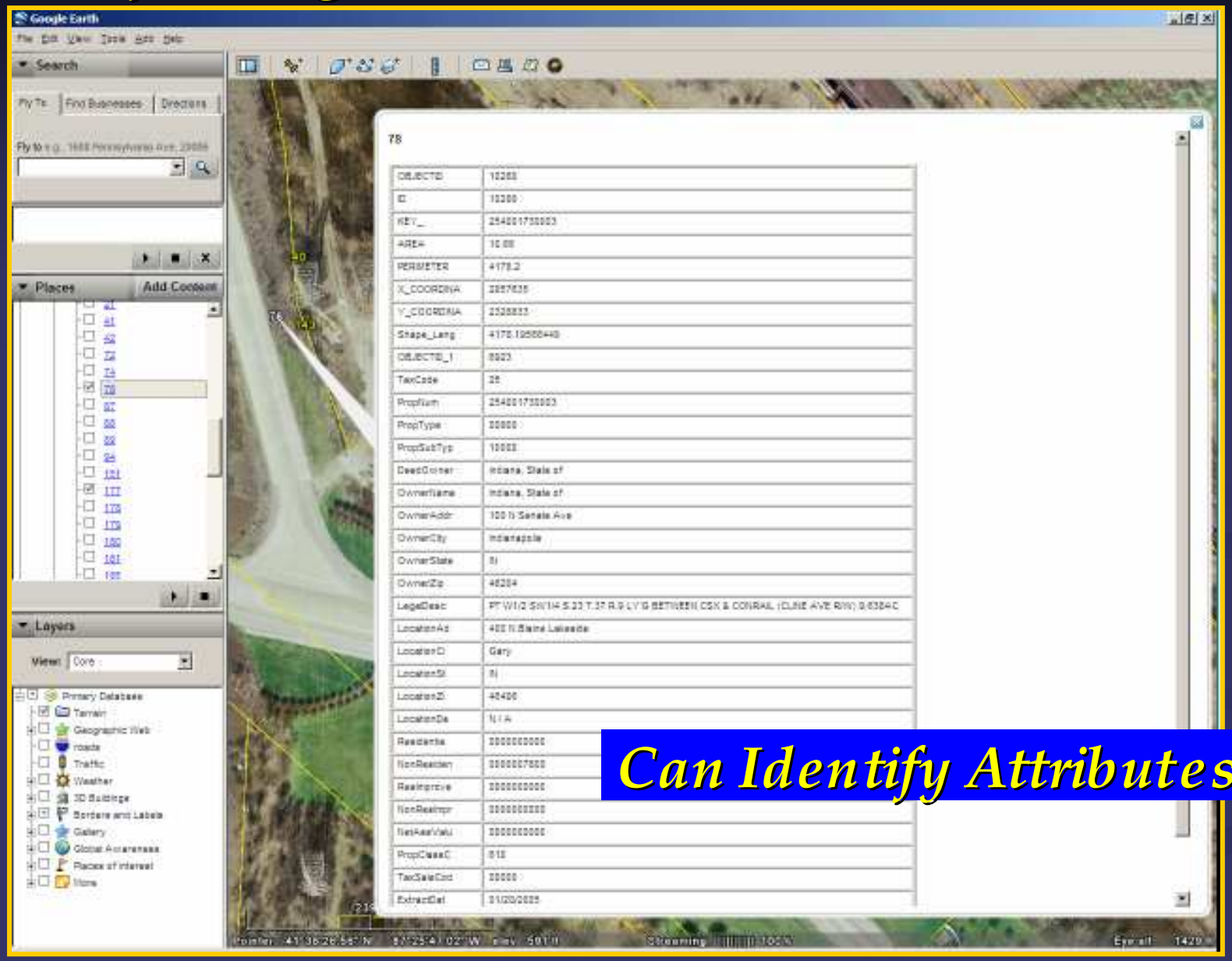
ArcMap+Google Earth -- Customized

Programmed to create 3 folders for each data layer:

- Features
- Labels
- Identify



ArcMap+Google Earth (Custom)-- Features



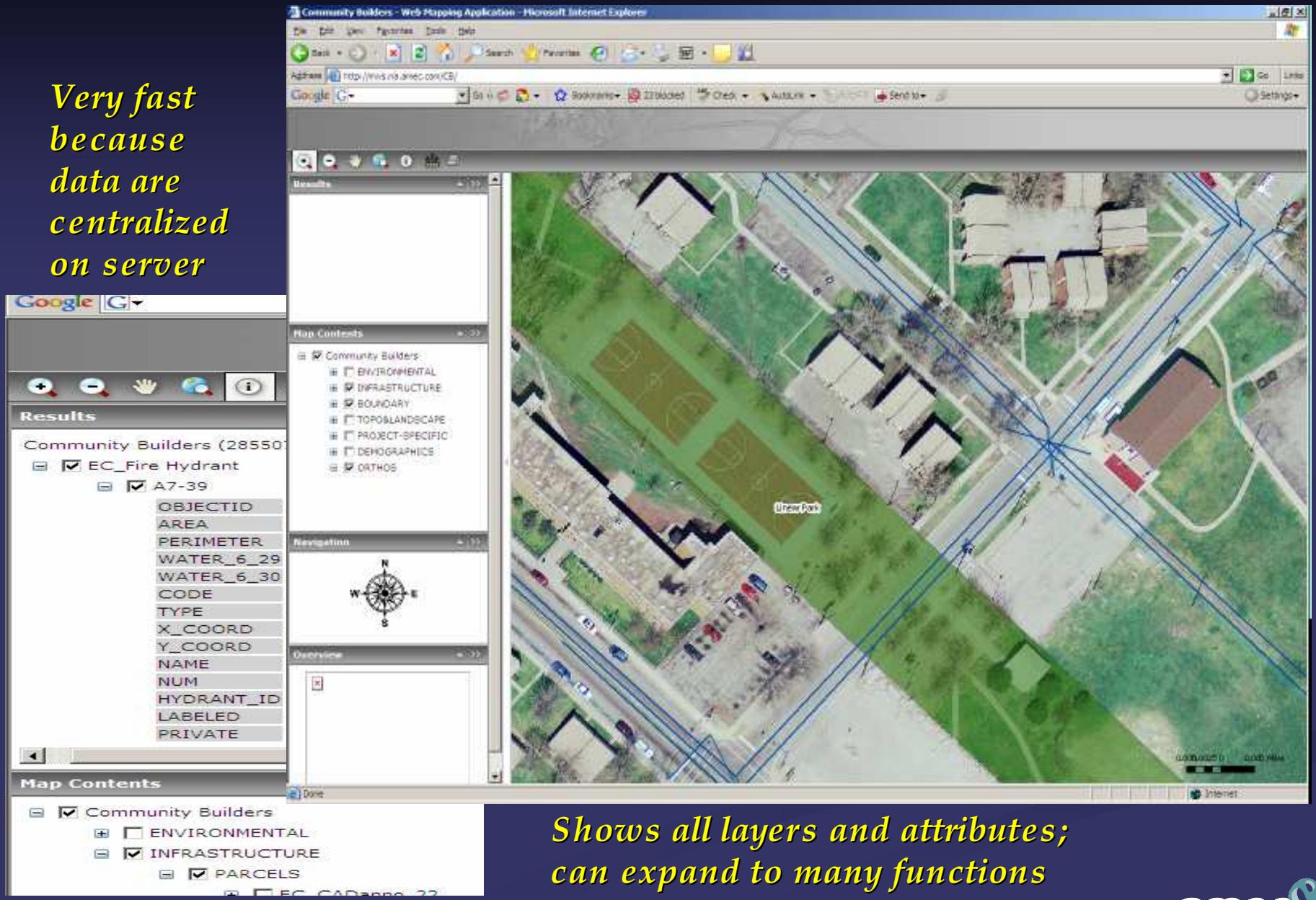
ArcMap+Google Earth--Limitations

- Professional license $400
- Can be very slow--subject to limitations in individual's PC and Internet connection
- Does not allow for advanced labeling
- Cannot easily see data attributes; folders are awkward
- Does not allow for printing to scale

4. Custom Website

Custom Website

Very fast because data are centralized on server



Shows all layers and attributes; can expand to many functions

Custom Website--Features

- Faster than other solutions
- Completely expandable to many new functions
- Can click on map and view attributes
- Retains labels and symbology from base map
- No software necessary, only Internet connection needed
- Centralized data
- Can add levels of security

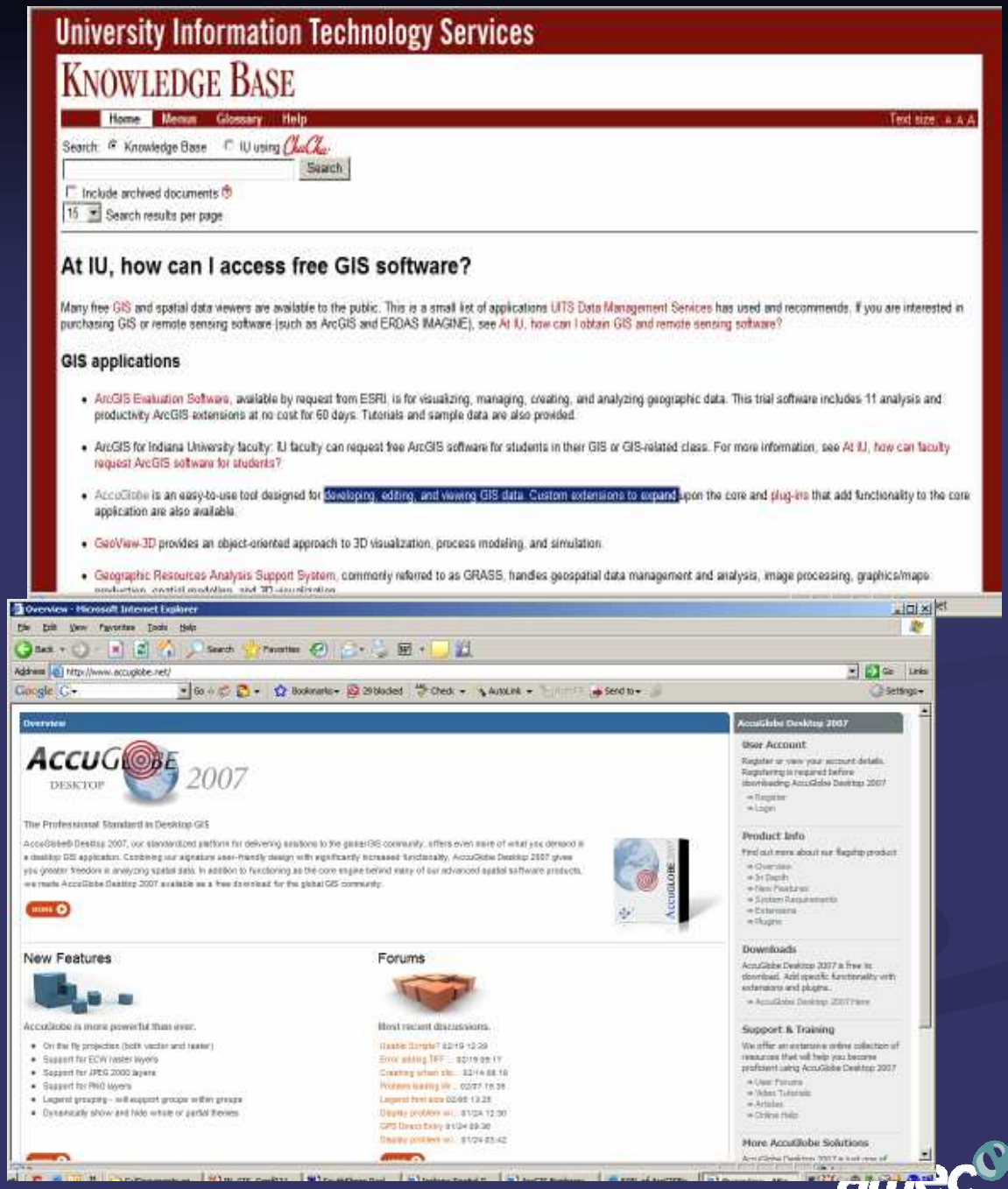
Custom Website--Limitations

- Requires programming/custom development
- Cannot add 3D files
- Requires cost for hosting & maintenance

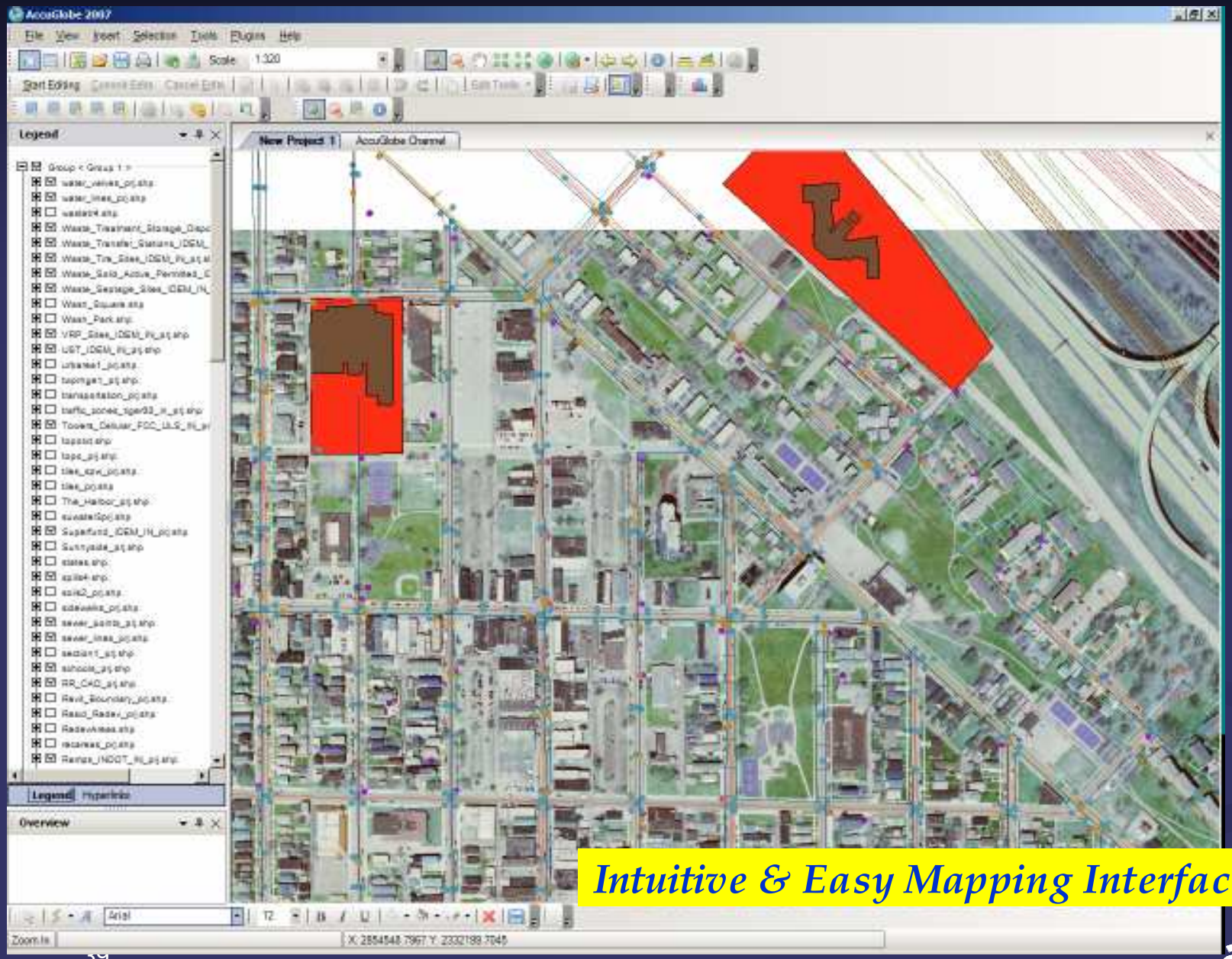
5. AccuGlobe

AccuGlobe

- *Developed by Digital Data Technologies, Inc. (ddti)*
- *Linked to IN Spatial Data Portal*
- *Distributed widely in Midwest*



AccuGlobe--Features



AccuGlobe Formats Supported:

Vectors:
- .shp
- .mdb

Rasters:
- MrSID
- .tiff
- .bil
- .gif
- .jpg
- .lan
- .png
- .bmp

Misc.:
- .txt
- .ecw

Not Supported:

- File GDB
- CAD
- Sketch Up, .kml
- SID > 50 mb
- Compressed SID

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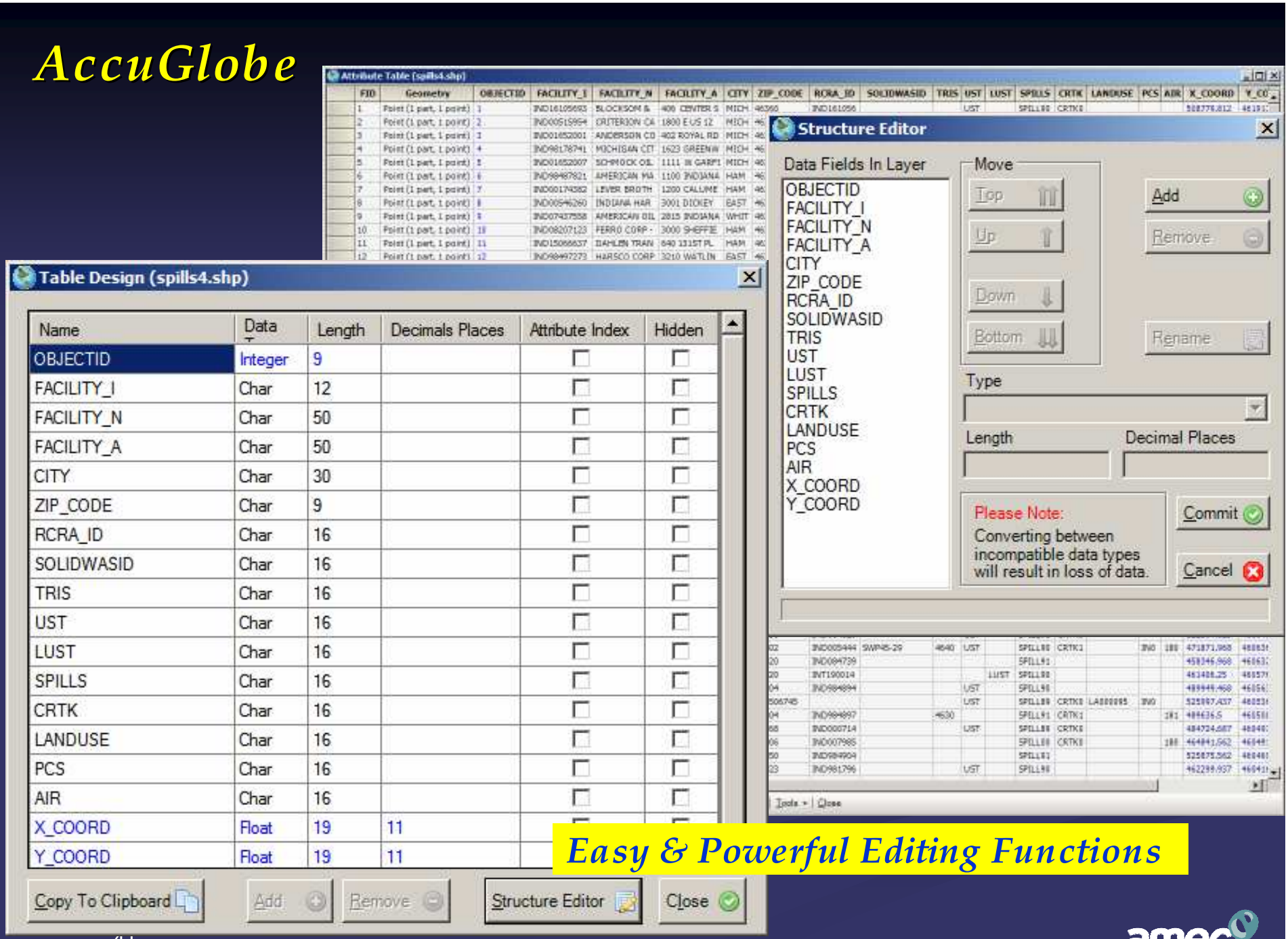
AccuGlobe



Easy & Powerful Editing Functions

AccuGlobe

Advantages

- Free
- All common map functions
- Powerful labeling, symbology functions
- Query, Relates, Merge
- Advanced printing
- Can create charts
- Advanced editing
- Automated updates to software
- Numerous custom extensions

Limitations

- Limited size for images (50 mb for .tiffs)
- Cannot add File gdb format
- Cannot add CAD or 3D
- Local (not centralized) data source

Criterion	ArcReader	ArcExplorer	ArcMap+ Google Earth	Custom Website	AccuGlobe
Cost		✓			✓
Easy to Use	✓			✓	✓
View Attributes	✓			✓	✓
Centralized Data & Dynamic	✓	✓	✓	✓	
Editing					(✓)
Image Resolution			✓		
Speed				✓	✓
Expandability	✓		✓	✓	
Add 3D		✓	✓		
Add CAD	✓				
Printing	✓				✓
Security	✓			✓	

Created Dashboard to Deliver Data & Help

SouthShore Redevelopment Project, East Chicago/Gary, IN
Viewer & Mapping Support

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The Community Builders, Inc.

There are 2 viewers and supporting software for the project: ***(1) is a GIS-based*** *(ESRI ArcView) map with detailed symbology and information on attributes (there are 2 versions-one with aerial photos, and one without, which takes up less space and is faster);* ***(2) is a Google-based*** *map with limited layers for viewing 3D Sketch-Up files.*

To download the files, right click on link ("Select" buttons), then select "Save Target As", and copy to your local computer. If the files are zipped (xxx.zip), right click on zip file name, and select "Extract Here" to place unzipped file on your computer. Minimum computer System Requirements are given below.

(1) Base Map (ArcReader)

► *Select Base Map Software and Download*
(path N:\034678250_TheCommunity_Builders\Viewers\ ArcReader92.zip)

► *Select Base Map Viewer and Download*
(path N:\034678250_TheCommunity_Builders\Viewers\CB.pmf)

► *Select Compressed Base Map Viewer and Download*
(path N:\034678250_TheCommunity_Builders\Viewers\CB_Compressed.pmf)

► *Select Software Help/Instructions*
(path N:\034678250_TheCommunity_Builders\Viewers\ ArcReader_Tutorial.pdf)

► *Select Quick StartSoftware Help/Instructions*
(path N:\034678250_TheCommunity_Builders\Viewers\ arcreader-quickstart-tutorial.zip)

► *System Requirements-READ ME FIRST*
(path N:\034678250_TheCommunity_Builders\Viewers\ ArcReader_Requirements.doc)

(2) 3D Viewer (ArcMap+GoogleEarth)

► *Select 3D Viewer Software and Download*
(path N:\034678250_TheCommunity_Builders\Viewers\ Google_Earth_BZXD.exe)

► *Select 3D Viewer and Download* (just download &open in GoogleEarth)
(path N:\034678250_TheCommunity_Builders\Viewers\ CommunityBuildersExternal.kmz)

► *Select Specific Software Help/Instructions*
(path N:\034678250_TheCommunity_Builders\Viewers\ GoogleBaseMapHelp.pdf)

► *Select GoogleEarth Help/Instructions* (just copy & paste into browser)
(path http://earth.google.com/userguide/v4/)

► *Report an Error or Problem*

On the Horizon…….

- Migrate data to SDE
- Compression of aerials for .pmf
- Network Links for ArcMap+Google Earth
- Export .kml from Microstation?
- Image Server ?
- Virtual Earth with 9.3 ??

Conclusions

- No single solution was adequate for project needs
- Delivered ArcReader for 2D and the Customized ArcMap+Google Earth (with fewer layers) for 3D
- Technology in state of development
- Prioritizing criteria is essential

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